and the melter feed processes) are examined through a program of research and development. Such development work includes ~~building and~~ operating a ~~full-scale~~ pilot (cold operation) melter and associated feed and mechanical handling systems. This prototype is used to examine and prove novel processes, test the design and maintainability of components, and provide operator training in operational and maintenance activities. To support the use of new and novel uses of existing technologies and processes and new equipment, it may be necessary to develop ad hoc standards. The use of ad hoc standards is discussed in SRD Volume I, Section 3.4.2, "Identification of Consensus Codes and Standards."

The TWRS-P Facility design incorporates passive and active engineered features that prevent and mitigate the potential for radiological and chemical exposures to the public, worker, and the environment. In the selection of required controls, preference is given to accident prevention over mitigation and engineered features over administrative controls. Preference is also given to passive engineered features over active engineered features. The selected features are based on proven technologies used by BNFL in its nuclear chemical plants for the last 25 years. The designation of safety features is made during the hazard evaluation and accident analysis processes.

Examples of passive and active features are described in the following sections.

3.7.1 Passive Features

Facility processes are confined by at least two barriers facility and process equipment provides the first barrier, and a cell or similar enclosure provides the second. This secondary confinement barrier has appropriate levels of shielding to ensure that radiological exposure does not exceed standards. Confinement and shielding design are established, as are the codes and standards that are used. Aspects of confinement design ensure that failure of one barrier does not lead to failure of the other (i.e., confinement is diverse). For example, should a process vessel or pipework leak (loss of primary confinement), the liquor drains to the cell sump where it can be recovered. The cell is lined to prevent liquor leakage. The potential for failure of a process vessel or piping is reduced by the selection materials resistant to erosion and corrosion and the use of direct inspection or erosion/corrosion coupons as discussed in Section 3.13, "Reliability, Availability, Maintainability, and Inspectability (RAMI)."

3.7.2 Active Features

The facility ventilation systems are designed to minimize the potential for radiological and chemical release into or out of the facility. The air flow into the facility is drawn through areas designated as having no potential for radiological or chemical release, through areas of successively higher potential. This air is then filtered before release. The principles behind the design and the systems employed are tried and tested components. Additionally, the ventilation systems contain redundant equipment (fans, filters, electrical supply) to protect against single active failures.

The selection of facility equipment required to perform a safety function is based on proven design. The safety performance function requires that suitable testing and maintenance regimes are in place to ensure reliability. For example, where programmable logic controllers are used, specific attention is given to their unique requirements relative to software verification and protection against electromagnetic interference (See SRD Safety Criterion 4.3-1). Protection

Radioactive systems at the TWRS-P Facility are designed to minimize the potential for leaks of radioactive material. Radioactive leaks are collected and segregated from non-radioactive waste streams. To the extent possible, radioactive leaks are returned to the process stream.

~~Process vessel vents~~Melter offgas streams are treated to scrub out radioactive particulates before passing through filter media. The scrub streams are returned to the process stream.

The interfaces between non-radioactive service systems (e.g., cooling water) and radioactive systems are designed so that any leakage is from the clean side to the radioactive side of the interface.

The confinement system design and access control features described above serve to minimize the spread of radioactive contamination in the TWRS-P Facility. During operation, movement of clean materials into potentially contaminated areas is minimized to aid in contamination control, minimize replacement and survey costs, and minimize radioactive waste volumes and costs. Tools in contaminated areas are controlled and reused to the extent possible.

3.10 EMERGENCY PREPAREDNESS

The TWRS-P Project implements and maintains an emergency management program to respond promptly, efficiently, and effectively to emergencies involving TWRS-P Facility, activities, or operations. The applicable requirements of federal, state, and local agencies are integrated into a single comprehensive program. The magnitude and scope of the emergency management program are determined by the final assessment of the hazards and hazardous situations to be completed in Part B.

The TWRS-P Project emergency management program is being designed to function within the existing Hanford emergency management community. Community planning partners are the DOE; DOE contractors; the Washington Public Power Supply System; U.S. Ecology; the State of Washington; and Benton, Franklin, and Grant Counties. The TWRS-P Project emergency management program is being developed and will be implemented to be consistent with the *Hanford Emergency Response Plan* (DOE-RL 1994), to ensure a timely and integrated response and to eliminate duplication of effort within the planning community. Agreements will be established to enable the TWRS-P Project to use existing Hanford response capabilities (e.g., fire, medical, hazardous materials spill response, consequence assessment, law enforcement, and communications). The facility design facilitates access and intervention by the Hanford Site fire department (e.g., the ability to connect to the interior standpipe system). The TWRS-P Facility Emergency Management Administrator participates in and supports Hanford Site and local area emergency planning organizations, including the Hanford Emergency Planning Council and the local Emergency Planning Committee.

The TWRS-P Project emergency management program is being developed for compliance with the requirements of 40 CFR 68, Chemical Accident Prevention Provisions, “40 CFR 355, “Emergency Planning and Notification,” 29 CFR 1910.38, “Employee Emergency Plans and Fire Prevention Plans,” 29 CFR 1910.119, “Process Safety Management of Highly Hazardous Chemicals,” and WAC 173-303-350, “Contingency plan and emergency procedures.”